SIEMENS

LITHOSTAR Multiline

SP

Adjustment instructions

Instructions for isocenter adjustment

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Register
Print No.: RXL2-120.071.01.04.02

English
Doc. Gen. Date: 05.97

Replaces: RXL2-120.071.01.03.02

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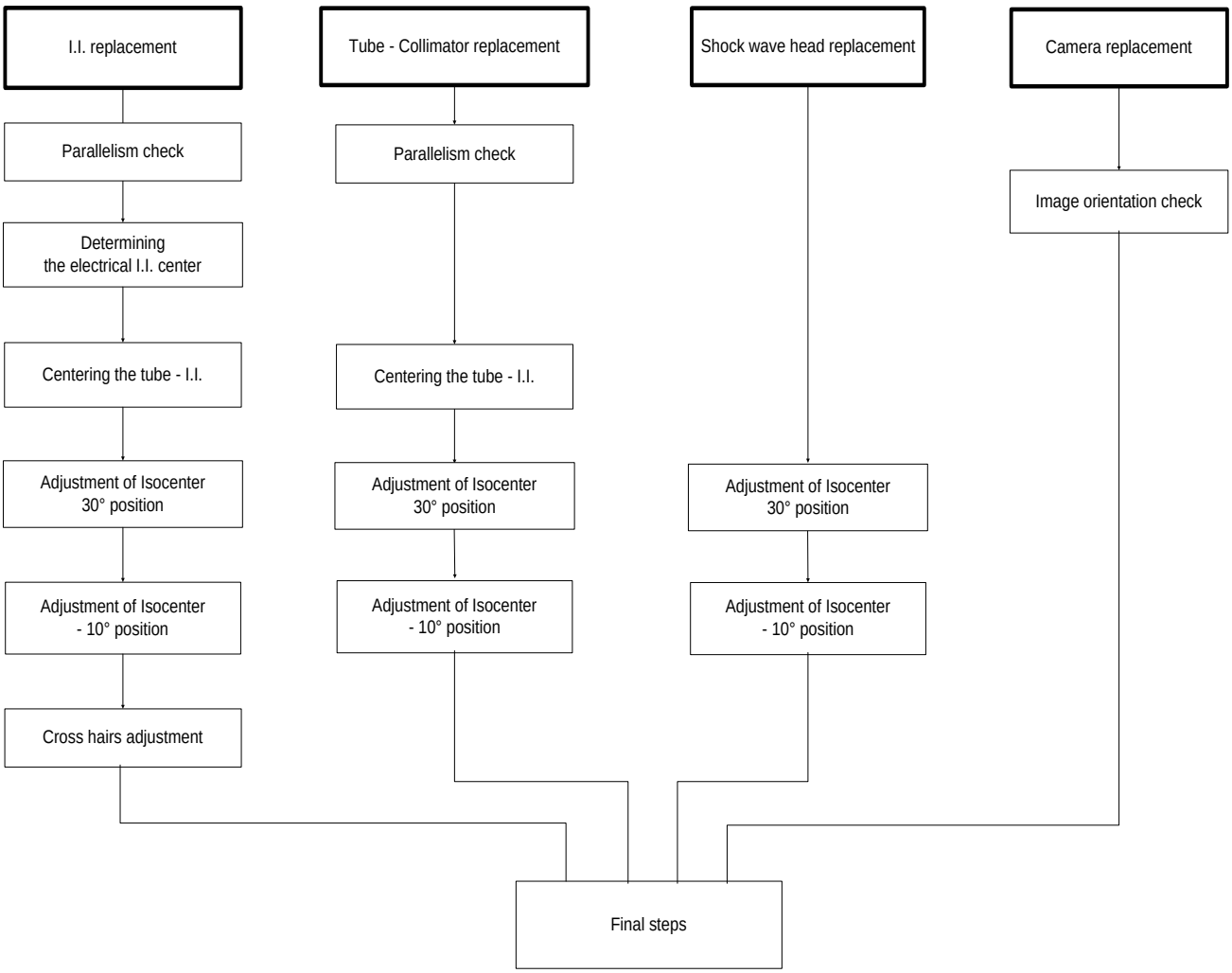
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NOTICE **These instructions describe all centering procedures. Perform only the adjustments necessary for the system you are servicing.**

Tools and auxiliary devices required

- Standard installation tools
- Water level
- M6 washer (hole diameter 6 - 6.5 mm)

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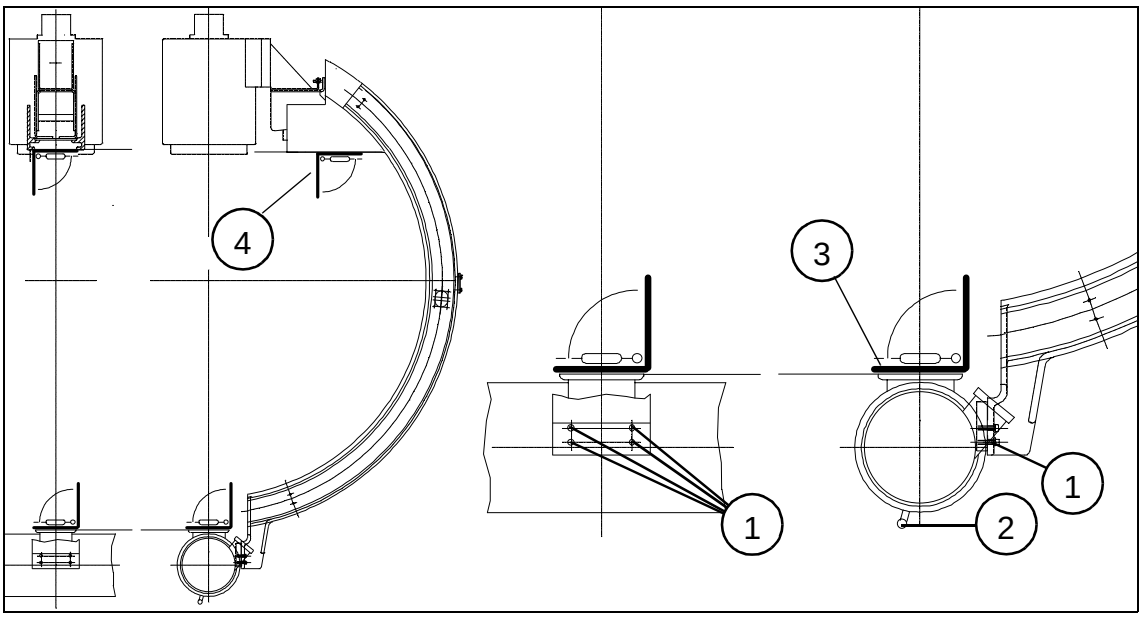

Fig. 1

Parallelism check

- Remove the covers of the shock wave head.
- Mount the short table extension to the left side of the table.
- Move the C-arm into the 0° position.
- Remove the I.I. collision protection.
  - Insert the jumper at X18 or make a connection using a wire.

When replacing the X-ray tube:

- Prior to mounting the collimator to the machined flange surface (3/Fig.1) , place a protractor spirit level on the flange and check whether it is level.
- If necessary, adjust the position.

Adjusting the X-ray tube:

- Patient longitudinal direction 4x screws (1/Fig. 1)
- Patient transverse direction Mounting ring screws (2/Fig. 1)

When replacing the I.I.:

- Check that the image intensifier is level.
  Place a water level on the machined surface (4/Fig. 1) and adjust as follows:

Adjusting the I.I. parallelism:

- 23 cm I.I.	Patient longitidunal direction	screws (3/Fig. 2)
	Patient transverse direction	screws(4/Fig. 2)
- 33 cm I.I.	Patient longitudinal direction	screws (4/Fig. 4)
	Patient transverse direction	screws (3/Fig. 5)

Determining the electrical I. I. center

- Attach a washer to the center of the I.I. input. (Remove the grid; the plate with the center cross may remain attached.)
- Attach a transparent piece of tape in the center of the monitor.
- Select the smallest zoom format.

- Release fluoro.
- Mark the image of the washer on the adhesive tape.
- Select full format.

- Release fluoro.
  The washer must appear centered on the marking (smallest format on the adhesive tape).
- If necessary, shift the washer on the I.I. input and repeat the entire procedure, until the "electrical center" is determined.
  (tolerance ± 1 mm).

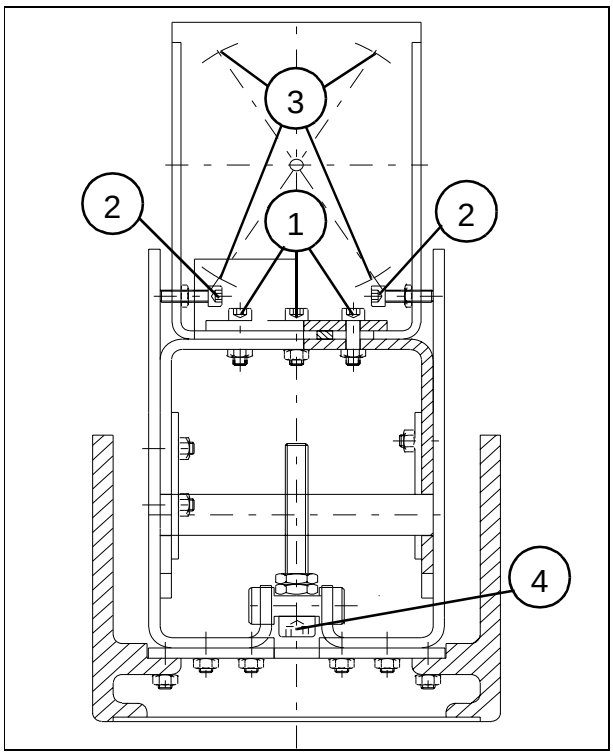

Fig. 2

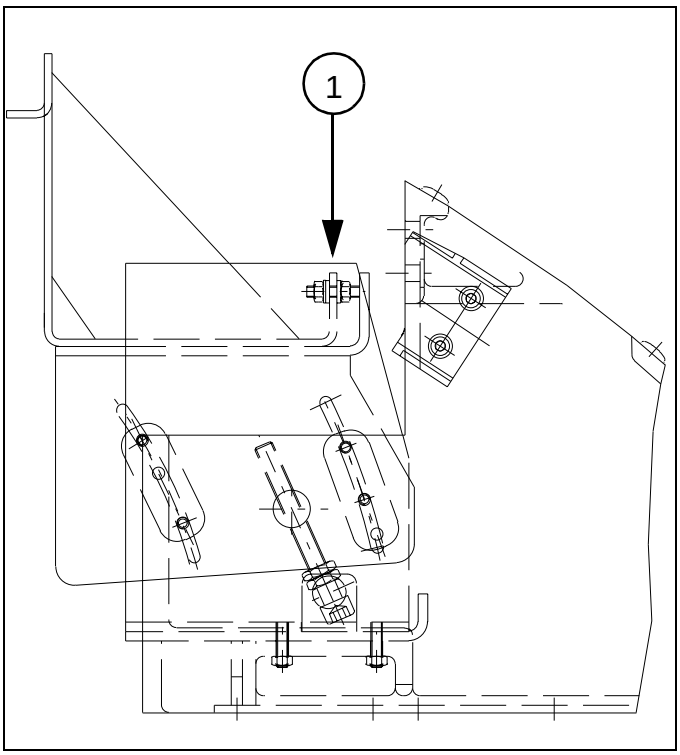

Fig. 3

Adjusting the 23 cm I.I.

Parallel adjustment in the patient longitudinal direction

- Remove the 9 screws (1/Fig. 2) .
- The image intensifier can be shifted in the patient longitudinal direction by loosening or tightening the 4 screws (2/Fig. 1) .

Parallel adjustment in the patient transverse direction

- Turning the screw (1/Fig. 3) shifts the I.I. in the patient transverse direction.
- Retighten the 9 screws (1/Fig. 2) .
- Close the collimator.
- Release fluoro and check whether the radiation field appears to be centered to the marking on the image intensifier (washer or center cross).

If not, proceed as follows:

- Remove the lower rubber panelling with a 2.5mm Allen key (2 screws).
- Loosen the two screws on the inside with a 3mm Allen key.
- Remove the panelling from the top of the C-arm (4 panelling screws with 2.5mm Allen key)
- Loosen the two screws with a 6mm Allen key, but do not remove them.
  The rubber panelling can now be removed towards the top.
- Reinstall the rubber panelling in the reverse order.

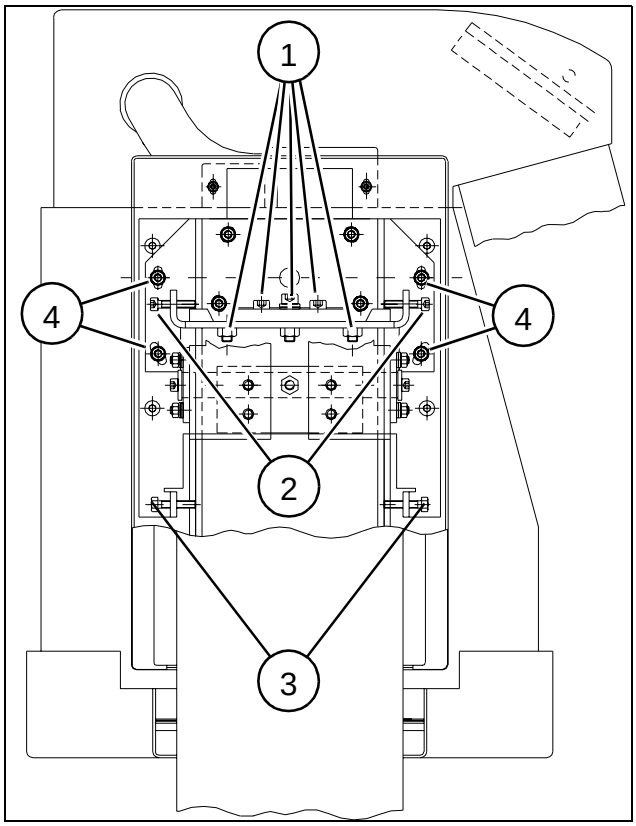

Fig. 4

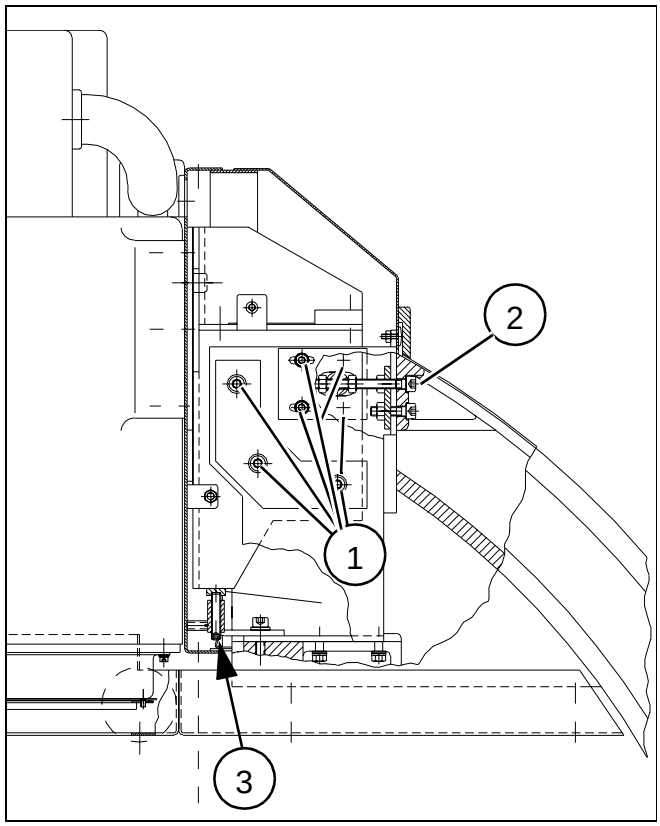

Fig. 5

Adjusting the 33 cm I.I.

Removing the I.I. mounting covers

- Loosen the set screws on the U-latch and remove them from the top.
- Loosen only the 6 cover screws (white) ; do not remove them.
- Loosen the 4 cover clamps and remove the cover.
- Loosen only the two upper and four lower white cover screws; do not remove them. Pull the cover off toward the back.
- Reinstall the covers in the reverse order.

Parallel adjustment in the patient longitudinal direction

- Remove the five Allen screws (1/Fig. 4) (Only 3 screws are pictured).
- The I.I. (2/Fig. 4) can be shifted with the screws in the patient longitudinal direction.
- Retighten the five Allen screws (1/Fig. 4).

Parallel adjustment in the patient transverse direction

- Remove the 7 screws (1/Fig. 5) on each side.
- The I.I. can be shifted with the screw (2/Fig. 5) in the patient transverse direction.
- Retighten the screws (1/Fig. 5).

Adjustment of the isocenter, +30°/-10° position

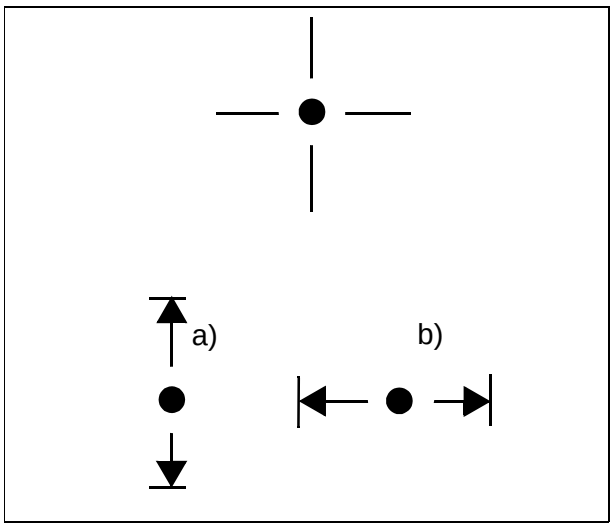

Fig. 6

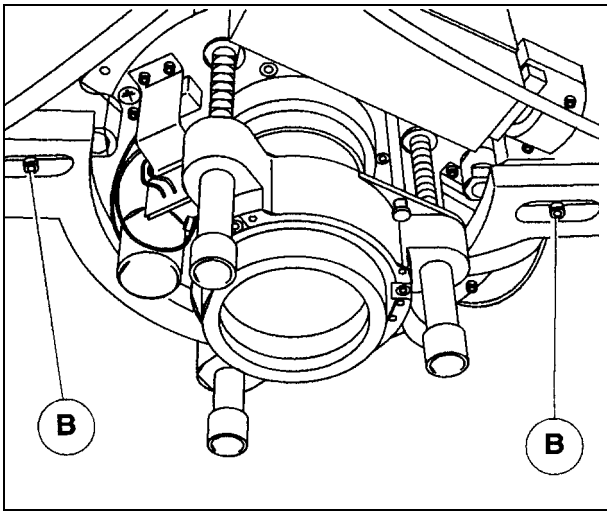

Fig. 7

Adjustment of the isocenter, +30° position

- Move the shock wave head into the coupling position (not to be confused with the gel position).
- Attach the adjustment device.
- Move the C-arm into the 30° position.
- Release fluoro.
  The adjustment ball must be located in the center of the indicator or the cross hairs (refer to Fig. 10)

a) Shifting in the longitudinal patient direction

- Loosen the mounting screws (B/Fig. 7) for the shock wave head.
- Shift the shock wave head in the longitudinal patient direction until the ball lies within the marking (indicator, centering cross-hairs) with fluoro.

- moving the ball in the monitor image	↑	↓
- moving the shock wave head in the unit	←	→

(For the directions indicated, the short table extension must be attached to the left side of the table. Otherwise the figure is displayed laterally reversed.
In addition, prone position must not be selected).

- Retighten the mounting screws.

b) Shifting in the transverse patient direction

- Connect the service PC to MULTILINE.
- Connect the DVM to measurement points D5.X12 and D5.X30 (0V).
- Check the value at X12 (pot value R3 for W drive); it should be 4.77 V ± 5 mV.
- Go into the ”uncontrolled mode” as described in the chapter ”System Logon, Adjustment Calibration” of the operating instructions for service software (RXL2-120.113.01...).

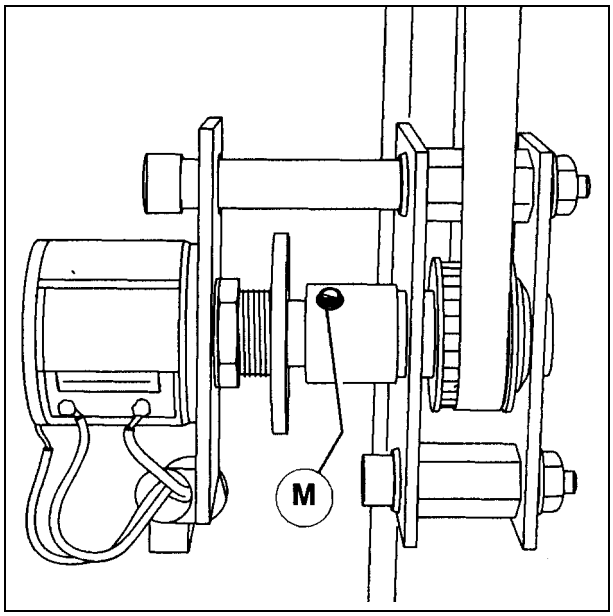

Fig. 8

CAUTION **The system is in the "uncontrolled mode". This means that the program no longer monitors system movements. Avoid points of collision.**

- Switch on fluoro. Move the ball into the center of the indicator or the cross-hairs) via the tableside control. Use the keys for the W drive.
- Change from the "uncontrolled mode" to the standard operating mode.

CAUTION **Perform a reset at Host D1 each time you set the R3 value.**

- Loosen the set screws (M/Fig. 8) of potentiometer R3 (1.5mm Allen key required) and rotate the potentiometer, until the nominal value of 4.77 V ± 5 mV is attained on the DVM. (ADC value 954 ± 4 on the service PC
- Retighten the screws .
- Readjust reference switch S3:
  - the switch must be closed in the range between 4.75V and 4.79V, (ADC value 954 ± 4)
  - the switch must be open in the range between <4.73 V (ADC value > 946) and > 4.81 V (ADC value > 962).

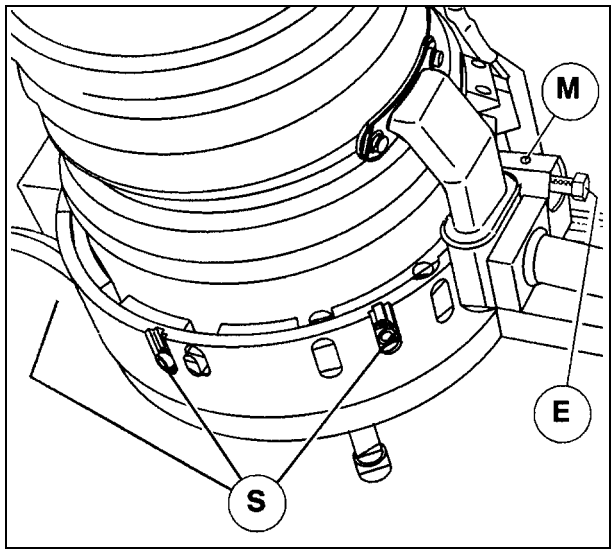

Fig. 9

Adjustment of the isocenter, -10° position

- Move the tube into the -10° position.
- Switch on fluoro.
  The adjustment ball must be located in the center of the indicator or the cross hairs. If required, adjust it.
- Loosen the three mounting screws (S/Fig. 9) at the shock wave head.
- Loosen the set screws (M) at the eccentric adjustment (E) (Fig. 9).
- Move the ball into the center of the indicator or cross hairs by pushing the excentric screws on the shock wave head.
  Do not move the shock wave head out of alignment.
- Retighten the shock wave head mounting screws (S/M Fig. 9) .
- Switch on fluoro. Alternately select the +30° and -10° position and verity that the ball is displayed in the isocenter.
- If necessary, repeat the adjustment of the isocenter until there is no more drifting.
- If a washer was attached for centering, remove it.
- Remove the adjustment device.
- Move the W drive back into the coupling position.
- Remount the adjustment device.
- Check the isocenter adjustment in both the +30° and -10° positions with fluoro ON.
  If necessary, repeat the isocenter adjustment.
- Remove the adjustment device (does not apply to replacement of the I.I.)
- Perform the cross hairs adjustment or final steps.

Cross hairs adjustment

The shock wave head is in the coupling position (not to be confused with the GEL position).

- Switch fluoro on and check the isocenter at -30° and -10°.

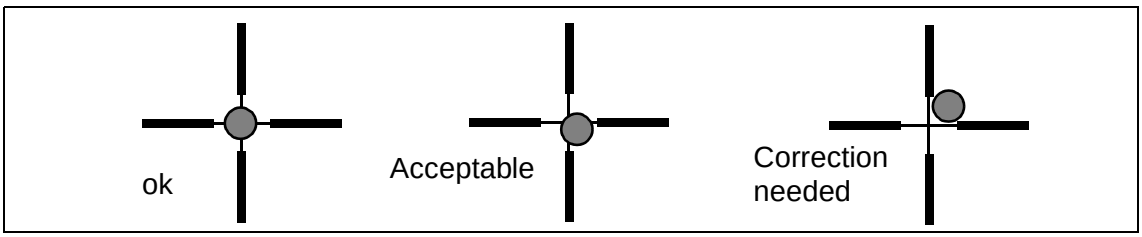

Fig. 10

- If the cross hairs need to be adjusted, the I.I. collision protection and the grid cover ring on the I.I. must be removed.

CAUTION	**The grid is attached by means of this cover and must also be removed.**

- Bypass jumper X18, so that the safety circuit is activated.
- Loosen the screws in the retainer ring far enough so that the cross hairs can be adjusted.
- Switch fluoro on and move the centering cross hairs until the ball of the adjustment device is displayed in the center of the marking in both projection planes (-30° and -10°).
- Tighten the cross hairs mounting screws. Ensure that the retainer ring does not bend.
- Insert the I.I. grid at an angle of 45° (± 10°) between the bolts of the retainer ring.
- Reinstall the I.I. collision protection and tighten the grid cover ring on the I.I. from below to secure the grid and to prevent twisting.

Image orientation check

- Close one of the collimator pairs completely.
- Open the other collimator pair completely.
- Release fluoro.
- Check whether the image orientation is vertical or horizontal on the monitor.
- To adjust, loosen the mounting screws on the camera and turn the camera head.
- Check the image orientation again with FL .

Final steps

- Remove jumpers at plug X18 .
- Reinstall the I.I. collision protection.
- Reinstall the shock wave head cover.
- Measure the protective conductor function.
- Perform an IQ test according to chapter 6 "Dose rate" of the Start-up Instructions (does not apply when replacing the shock wave head).
- Replace or supplement the documents.
- Check all functions.

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	Templates changed
Chapter 0	Revision level and table of contents adjusted
Chapter 1	Text changes
Chapter 2	New
Chapter 3	New

TD SP 1 / Schlee

TD SP 2 / Wendt

SMS Iselin

3 - 2 Changes as compared to previous versions

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